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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/586,105

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Roger Ian Crickmore

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EXAMINER

SHAH, SAMIR M

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/586,105	<b>Applicant(s)</b> CRICKMORE ET AL.	
	<b>Examiner</b> SAMIR M. SHAH	<b>Art Unit</b> 2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 3/31/2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3-12,14,15,17 and 20-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-12,14,15,17 and 20-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed 03/31/2009, with respect to the 35 U.S.C. §102 (b) rejection of claims 1, 3-12, 14, 15, 17 and 20-22 as being anticipated by Thomas (International Patent Application WO 03/081186 A2 henceforth "Thomas") have been fully considered but they are not persuasive.

(a) As to applicant's argument, "Thomas does not disclose the feature of claim 1 that axial compression of the cylinder by the seismic mass increases stress in the optical fibre", the Examiner disagrees.

Thomas discloses, "fibre coil (11) is wound on to this part of the device (10)...[b]ecause of the shape factor in the device there is mechanical amplification between the axial and the radial motion" on page 6, lines 29-31. Thomas further discloses, "net force acting in the direction of the long axis of the device changes from compressive to extensional...the device must be pre-stressed so that in normal use the net forces acting along the long axis of the device must remain either compressive or extensional" on page 8, lines 20-26.

The fibre coil (11) is wound onto the device (10) in it's axially central part as shown in figures 2 and 4. Thomas describes the "shape factor" and the "mechanical amplification" between the axial and radial motion of the cylinder (12) which implies an increase in stress in the optical fibre coil (11) when axial compression is applied to the

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cylinder (12). Moreover, as described below, since suspension system (25) prevents axial displacement within the cylinder (12), the cylinder would end up bulging at its center due to axial compression thereby increasing stress in the optical fibre coil (11).

(b) As to applicant's argument, "[l]ooking at Thomas...it can clearly be seen that there is nothing preventing the internal surface of the concave cylinder 12 from deformation...in order for the device of Thomas to function as described, the internal surface of the cylinder must be free of obstruction to allow the cylinder to deform inwardly under axial compression of the cylinder", the Examiner disagrees.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "preventing the internal surface of the...cylinder...from deformation") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Claim 21 recites, "internal surface of said cavity is constrained against radial displacement", which does not include all possible types of deformation but only includes radial displacement.

Moreover, Thomas teaches "restrain[ing] movement in the non-axial direction" on page 3, lines 22-24. Also, contrary to applicant's assertion, Thomas clearly intends to constrain the cavity against radial displacement by disclosing "a suspension system

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(25), to prevent sideways motion but allow axial motion of the device” on page 6, lines 18-20.

(c) Accordingly, the 35 U.S.C. §102 (b) rejection of claims 1, 3-12, 14, 15, 17 and 20-22 as being anticipated by Thomas is still maintained and hereby made FINAL.

### ***Claim Objections***

2. Claims 15 and 17 are objected to because of the following informalities:

(a) As to claim 15, last line, delete “optic fibre” and replace it with --optical fibre--.

Appropriate correction is required.

(b) Claim 17 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 17 recites, “compression of the cylinder by the seismic mass increases stress in the optical fibre”, which is the same as the recitation in claim 15, “axially displacing the seismic mass so as to compress the cylinder thereby increasing the stress induced in the optical fibre”.

### ***Claim Rejections - 35 USC § 102***

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3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3-12, 14, 15, 17 and 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas.

(a) As to claim 1, Thomas discloses a fibre optic accelerometer (10) comprising a seismic mass (23) coaxially constrained within a cylinder (12) of compliant material , arranged to prevent the cylinder deforming inwardly under axial compression (figures 1-7; page 6, line 22 - page 7, line 28), the cylinder (12) being circumferentially wound with optical fibre (11) (figures 1-7; page 2, line 18 - page 3, line 3; page 6, line 6 - page 8, line 9), such that axial compression of the cylinder (12) by the seismic mass (23) increases stress in the optical fibre (11) (figures 1-7; page 7, line 12-22).

(b) As to claim 3, Thomas discloses that the seismic mass (23) includes a disc shaped portion (14) (figures 1-7; page 6, lines 6-20).

(c) As to claim 4, Thomas discloses that the seismic mass (23) is secured by a tension member (21) to a base plate (25) (figures 1-7; page 6, lines 6-20).

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(d) As to claim 5, Thomas discloses that a spacer (22) is provided between the cylinder (12) and the base plate (25) (figures 1-7; page 6, lines 6-31).

(e) As to claim 6, Thomas discloses that the spacer (22) is integral with the base plate (25) (figures 1-7; page 6, lines 6-31).

(f) As to claim 7, Thomas discloses the optical fibre (11) being wound in a single layer (figures 1-7; page 6, lines 6-31).

(g) As to claim 8, Thomas discloses the base plate (25) being integral with a platform or structure (figure 2; page 2, lines 18-20; page 6, lines 6-31).

(h) As to claim 9, Thomas discloses the seismic mass (23) being coaxially constrained within first and second cylinders (13) of compliant material, each cylinder (13) being circumferentially wound with optical fibre (11) (figures 5, 6; page 6, line 22 - page 7, line 28).

(i) As to claim 10, Thomas discloses the seismic mass (23) comprising a first circumferentially located bearer member (14) arranged to bear on an end of at least one of the compliant cylinders (13) (figures 1-7; page 6, line 22 - page 7, line 28).

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(j) As to claim 11, Thomas discloses the first circumferentially located bearer member (14) being arranged to bear on respective ends of both of the compliant cylinders (13) (figures 1-7; page 6, line 22 - page 7, line 28).

(k) As to claim 12, Thomas discloses a second circumferentially located bearer member (14) arranged to bear on an end of a second of the compliant cylinders (13) (figures 1-7; page 6, line 22 - page 7, line 28).

(l) As to claim 14, Thomas discloses an optical interferometer comprising an accelerometer (figures 8, 9; page 10, lines 1-31).

(m) As to claim 15, Thomas discloses a method of measuring acceleration comprising providing a seismic mass (23) coaxially constrained within a cylinder (12) of compliant material, the cylinder (12) being circumferentially wound with optical fibre (11), axially displacing the seismic mass (23) so as to compress the cylinder (12) thereby increasing the stress induced in the optical fibre (11) and determining a stress value in the optical fibre (11) (figures 1-7; page 2, line 18 - page 3, line 3; page 6, line 6 - page 8, line 9).

(n) As to claim 17, Thomas discloses the compression of the cylinder (12) by the seismic mass (23) increasing stress in the optical fibre (11) (figures 1-7; page 6, line 6-31).



(o) As to claim 20, Thomas discloses the compliant material being rubber like (figures 1-7; page 6, line 6 - page 8, line 32).

(p) As to claim 21, Thomas discloses a fibre optic accelerometer (10) comprising a body of compliant material having an internal cavity extending in an axial direction (figures 1-7; page 8, lines 5-9);

optical fibre (11) wound circumferentially around said body (figures 1-7; page 6, lines 6-31); and

a seismic mass (23) located within said cavity, wherein the internal surface of said cavity is constrained against radial displacement (figures 1-7; page 6, line 6 - page 8, line 9).

(q) As to claim 22, Thomas discloses the internal surface of the cavity being constrained by the seismic mass (23) (figures 1-7; page 6, line 6 - page 8, line 9).

### ***Conclusion***

5. The prior art made of record and not relied upon, cited in the attached 892 form, is considered pertinent to applicant's disclosure.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SAMIR M. SHAH whose telephone number is (571)272-2671. The examiner can normally be reached on Monday-Friday 10:00 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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7. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Hezron Williams/  
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05/21/2009